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# Comments on Proposed Rule Making

PR 93-61 / RM 8013

Regulations for Automatic Vehicle Monitoring

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# Amendment of Part 90

This is a very brief commentary on the NOTICE of PROPOSED RULE MAKING (PR Docket No. 93-61, RM-8013) concerning the adoption of regulations for automatic vehicle monitoring systems.

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## INTRODUCTION

The proposed frequency allocation addresses the interference potential of Vehicle Location Monitoring (VLM) or Location and Monitoring Service (LMS), and makes some effort to support the public interest by ensuring economic viability of those entities presently developing and fielding such services in the 902-928 MHz ISM band, as well as providing mechanisms for new competition. I am particularly pleased at the response concerning the Construction Period (III.5.26.56-57) *"...we do not want the frequencies to appear more congested than they really are."*

With regard to band sharing and interference, however, I would like to **propose that the FCC consider restricting all non fixed emitters in this band be limited to 1 Watt, except for government users.** This would include mobile, personal, animate and inanimate objects which may move the emitter more than 50 feet from a fixed geographical location. The value of this approach will be discussed in the following sections.

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# Position

PROBE Science takes the position that the RF Spectrum is a valuable public resource, and that FCC acts as a custodian of the public interest in the allocation of that resource. Further, we support the concept of band sharing and the mutual responsibility of the users of the RF spectrum to maximize the utility and minimize the interference to any users of the spectrum, not only the primary and secondary licensees.

We do not believe, however, that sharing can be accomplished on a basis where non parity exists. In that regard, and with great concern about the predictability of interference levels to all users, we propose to limit all non government mobile emitters in this band to some small but useful power level. Further, **we do not believe that other users (Part 15 and Part 97) need to be migrated to avoid harmful interference** if the higher power emitters in the

power levels which, while still reasonable, could easily overpower the non emergency services.

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## Location Monitoring Services

Accurate location measuring and monitoring systems are as important now as they have been throughout all of human history. Government and private agencies have expended billions of dollars to implement and perfect such systems, and they continue to proliferate. The ability to be able to pinpoint the location of a downed aircraft, pilot, hiker, a disabled pedestrian or automobile, provides increased safety both to emergency personnel and the distressed.

We support the continued development of inexpensive, accurate location monitoring services, but we do not think that these services need to involve the use of high power mobile emitters. Certainly the only beneficiary of such systems are automobiles or vehicles with substantial power sources.

To gain some perspective, witness the number of mobile phone users today, where the power levels are regulated and low, versus the problems that existed prior to the cellular system, where your access to a mobile phone line was determined solely by your ability to overpower someone else competing for the frequency. The cellular concept permitted hundreds of users to become thousands.

Perhaps reallocation of certain frequencies in the 902-928MHz to LMS dedicated phone lines would further the public interest. Perhaps even this is unnecessary due to existing or planned mobile digital services.

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## Interference

Interference in the RF Spectrum is purely a power issue. A receiver requires a certain energy per bit to achieve a specified error rate. Whatever mechanism is chosen to communicate that bit, narrow band, wideband, pulse, spread spectrum, etc., the same energy must reach the receiver, and given the same path loss, all systems require the same energy be transmitted. Since energy (measured in Watt-Seconds) is the product of time and power, the only way to use less power to transmit a bit with the same Bit Error Rate (BER), is to use more time.

Interference reduces the amount of energy per bit reaching the demodulator processor. Nearly all known, specific interference types may be compensated for. For example, narrow band interference can be removed by using wide band modulation and notching the interference prior to demodulation; pulse interference can be reduced by lowering the data rate and blanking the pulse before filtering or demodulation; etc. But

all these interference rejection techniques rely on the receiver being operated within its useful dynamic range when all signals (desired, noise, and interference) are present. **The only deterministic interference that cannot be dealt with is that which causes receiver overload.**

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## **Other Solutions**

In the proposed rule making, we ask that the FCC consider whether biasing the use of the 902-928 MHz toward LMS by excluding or migrating other users is necessary and beneficial. Most of the arguments in favor result from the particular implementations of LMS systems. Many of these are merely versions of earlier multi-lateralization schemes which might have been used except that they may have patent coverage by other than the proponents herein. As such, these implementations may not represent implicit technologically and environmentally superior systems.

Further, the market now has literally thousand of Part 15 devices serving the public for everything from wireless modems to heart monitors to light switches. This market was made possible only by the low cost electronics components created by the cellular phone industry's quantity demands. The greatest need for public spectrum in the near future resides in Wireless Personal Communications, of which location monitoring is only one piece.

The government already owns and has fielded radio location services from GPS to LORAN and OMEGA. All these systems, and GPS in particular, can be obtained for a cost on a par with that proposed for systems like Tele-Trac. If the primary use of the increased spectral allocation and protection is to emulate these services already in existence, then it is unnecessary. If the allocation is to provide communications between remote and mobile items, and a centralized tracking system, then the allocation should be made addressing those communications requirements, not the radio location systems alone.

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## **Summary**

**Leave the band open for all uses.**

**Limit the Power of all mobile units to one watt.**

**Permit higher power for fixed, surveyed facilities.**

**Permit higher power for government mobile units.**